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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/676,680

10/01/2003

Gail A. Alverson

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PATENT-SEA

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EXAMINER

WAI, ERIC CHARLES

ART UNIT

PAPER NUMBER

2195

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/676,680

Applicant(s)

ALVERSON ET AL.

Examiner

Eric C. Wai

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :10/01/2003, 08/26/2004, 10/07/2004, 06/09/2005, 07/13/2006, 03/02/2007, 05/31/2007.

DETAILED ACTION

1. Claims 1-33 are presented for examination.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 10-18, and 33 recite a "system"; however, it appears that the system would reasonably be interpreted by one of ordinary skill in the art as software, per se, failing to be tangibly embodied or include any recited hardware as part of the system.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4, 13, 28-30, and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. The following terms lack antecedent basis in the claims:

- i. Claims 28, "the modifying".
- ii. Claim 30, "the thread".

b. The following terms are not clearly understood:

iii. Claims 4 and 13 recite, "including starting the execution of the set jump thread". It is unclear when is this step performed (i.e. after setting the state?).

iv. Claim 28 recites, "setting a program counter in the thread control block to an address of a long jump routine". It is unclear whether this modifying step occurs regardless of the thread state.

v. Claim 29 recites, "putting the thread control block on a list of unblocked threads". It is unclear when this step is performed or if it is performed all the time regardless of thread state.

vi. Claim 30 recites, "invoking the long jump routine when the thread starts running.

vii. Claim 32 recites, ""creating a save area data structure ...". It is unclear how the save data structure is related to the rest of the invention. For instance, claim 32 also recites, "setting a program counter in the initialized data structure to an address of a long jump routine". It is unclear if this long jump routine is related to the set jump or if it can be any long jump routine.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 8-14, and 17-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nilsson (US Pat No. 6,289,446).

8. Regarding claim 1, Nilsson teaches a method in a computer system for performing an inter-thread long jump, the method comprising:

receiving an indication of a set jump location (col 5 lines 7-9);

determining whether a set jump thread that set the set jump location is the same thread that is currently executing (col 5 lines 19-22); and

setting a state of the set jump thread to execute a long jump indicating the set jump location (col 5 lines 16-19).

9. Nilsson does not explicitly teach the step of setting a state of the set jump thread to execute a long jump indicating the set jump location when the set jump thread is not the same thread that is currently executing.

10. Nilsson teaches how set jump and long jump instructions work within the context of exception handling.

11. It would have been obvious to one of ordinary skill in the art at the time of the invention, to set the state of the set jump thread to execute a long jump if the set jump

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thread is not the same thread that is currently executing. One would be motivated by the desire to ensure that the long jump is executed since the function call has been made.

12. Regarding claim 2, Nilsson teaches the setting of the state includes setting a program counter of the set jump thread to point to a long jump routine (col 5 lines 9-11).

13. Regarding claim 3, Nilsson does not teach that when the set jump thread is blocked on an operating system call, aborting the operating system call.

14. It would have been obvious to one of ordinary skill in the art at the time of the invention to include aborting the operating system call when the set jump thread is blocked on an operating system call. One would be motivated by the desire to continue execution of the set jump thread.

15. Regarding claim 4, Nilsson teaches starting the execution of the set jump thread (col 5 lines 16-19).

16. Regarding claim 5, Nilsson does not explicitly teach notifying the set jump thread of the inter-thread long jump when the set jump thread is running.

17. Nilsson does teach that the use of set and long jump is useful for global exceptions handling (col 5 lines 23-35).

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18. It would have been obvious to one of ordinary skill in the art at the time of the invention to include notifying the set jump thread of the long jump. One would be motivated by the desire to track any exceptions that occur.

19. Regarding claim 8, Nilsson does not explicitly teach determining whether the set jump thread still exists.

20. Nilsson teaches a possible disadvantage where the function that the long jump returns is no longer active (col 5 lines 36-38).

21. It would have been obvious to one of ordinary skill in the art at the time of the invention to include determining whether the set jump thread still exists. One would be motivated by the desire to solve the problem disclosed by Nilsson.

22. Regarding claim 9, Nilsson does not explicitly teach that the computer system supports multiple streams.

23. It would have been obvious to one of ordinary skill in the art at the time of the invention to include support for multiple streams. One would be motivated by the desire to increase the efficiency of Nilsson's system.

24. Regarding claims 10-14, and 17-18, they are the system claims of claims 1-5, and 8-9 above. Therefore, they are rejected for the same reasons as claims 1-5, and 8-9 above.

25. Regarding claim 19, Nilsson teaches substantially the method in a computer system for performing an inter-thread long jump in claim 1 above, and in addition the method comprising: wherein the long jump function deallocates memory allocated since the set jump function was invoked; restores the stored stream state; and jumps to the return address included in the restored stream state (col 5 line 62 to col 6 line 13).

26. Regarding claim 20, Nilsson teaches that the current stream state is stored in a set jump buffer (col 5 lines 6-9).

27. Regarding claim 21, Nilsson teaches that the restoring includes retrieving the stored stream state from the set jump buffer (col 5 lines 16-19).

28. Regarding claim 22, Nilsson teaches a method in a long jump thread of a computer system for performing an inter-thread long jump to a location in a set jump thread, the method comprising:

receiving information relating to the set jump thread (col 5 lines 3-6);

retrieving a thread identifier for the set jump thread from the received information (col 5 lines 19-22);

29. Nilsson does not teach retrieving a thread control block for the set jump thread based on the retrieved thread identifier; determining from the retrieved thread control block a state of the set jump thread; and causing, based on the determined state, the set jump thread to execute at a set jump location.

30. Nilsson's invention performs the long jump regardless of the thread state. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nilsson to include checking the state of the thread before executing a set jump. One would be motivated by the desire to alleviate some of the problems encountered in the prior art, such as stack maintenance, as evidenced by Nilsson (col 5 lines 36-50).

31. Regarding claim 23, Nilsson does not teach that the state of the thread is blocked, resumable, running, or transition.

32. It would have been obvious to one of ordinary skill in the art at the time of the invention to include that the state of the thread is blocked, resumable, running, or transition. One would be motivated by the desire to account for all thread status and to handle them accordingly.

33. Regarding claims 24-27, Nilsson does not teach that the thread state is blocked when the thread is blocked on a synchronization timeout; wherein the thread state is resumable when the thread is ready and waiting to be allocated to a stream; wherein the thread state is running when the thread is executing and is not blocked; and wherein the thread state is transition when the thread is being allocated a stream.

34. It would have been obvious to one of ordinary skill in the art at the time of the invention to have made these modifications to Nilsson. It is well known in the art that synchronization timeout cause threads to become blocked, a resumable thread state is

when the thread is ready and waiting to be allocated to a stream, a running thread state is when the thread is executing and is not blocked, and a transition thread state occurs when the thread is being allocated a stream

35. Regarding claim 28, Nilsson teaches setting a program counter in the thread control block to an address of a long jump routine (col 5 lines 16-19).

36. Regarding claim 29, Nilsson does not teach putting the thread control block on a list of unblocked threads.

37. It would have been obvious to one of ordinary skill in the art at the time of the invention to have included putting the thread control block on a list of unblocked threads. One would be motivated by the desire to change the thread state.

38. Regarding claim 30, Nilsson does not explicitly teach invoking the long jump routine when the thread starts running.

39. It would have been obvious to one of ordinary skill in the art at the time of the invention to invoking the long jump routine when the thread starts running. One would be motivated by the desire to perform the long jump.

40. Regarding claim 31, Nilsson does not teach that when the thread state is blocked, removing the thread from a blocked list; setting the thread state to resumable;

and when the thread is blocked on an operating system call, aborting the operating system call.

41. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nilsson to include removing the thread from a blocked list; setting the thread state to resumable; and when the thread is blocked on an operating system call, aborting the operating system call. One would be motivated by the desire to change the thread state to continue execution.

42. Regarding claim 32, Nilsson does not teach that when the thread state is running, when the thread is blocked on an operating system call, aborting the operating system call; when the thread is handling a data blocked exception, saving state information; creating a save area data structure; initializing the created save area data structure; and setting a program counter in the initialized data structure to an address of a long jump routine.

43. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nilsson. One would be motivated by the desire to save the state according to the set jump function.

44. Regarding claim 33, Nilsson teaches a system for causing a long jump thread to cause a set jump thread to start executing at a location specified by the set jump thread, the system comprising:

means for specifying a set jump location of the set jump thread (col 5 lines 14-16); and

means for, under control of the long jump thread, causing the set jump thread to jump to the set jump location (col 5 lines 16-19).

45. Nilsson does not explicitly teach that the set jump thread and the long jump thread are different. However, it would have been obvious to one of ordinary skill in the art at the time of the invention, that two different function can be performed by two different threads.

46. Claims 6-7, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nilsson (US Pat No. 6,289,446) in view of Slingwine et al. (US Pat No. 6,219,690 hereinafter Slingwine).

47. Slingwine was disclosed on IDS dated 05/31/2007.

48. Regarding claim 6-7, Nilsson does not teach directing the set jump thread to enter a known state prior to setting the state of the set jump thread, wherein the known state is a quiescent state.

49. Slingwine teaches entering a quiescent state (also known as a safe state) before performing updates (col 5 lines 33-56).

50. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nilsson. One would be motivated by the desire to ensure that the thread state would not be corrupted as taught by Slingwine.

51. Regarding claims 15-16, they are the system claims of claims 6-7 above. Therefore, they are rejected for the same reasons as claims 6-7 above.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012. The examiner can normally be reached on Mon-Thurs, 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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